

Student Panel Session: Exploring Mental Health and its Relationship with Engineering Culture Faculty

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Abstract— Student mental health issues have been on the rise in recent years. Many factors play a role in mental health issues, including culture and climate. Engineering culture is known to be very difficult and oftentimes toxic which can exacerbate mental health issues. This panel will discuss various mental health struggles and the ties between mental health and engineering culture. The goal of this panel is to get audience members thinking about how we can change engineering culture to be one that is more nurturing and places importance on mental well-being.

Keywords—well-being, mental health, engineering culture

I. GOALS

The goal of this student panel is to explore the breadth and frequency of engineering students' experiences of toxic engineering culture, and the subsequent effects on their mental health and well-being. These goals are best suited for a student panel because it will allow for the student perspective to be amplified and be a point of connection for other students in the audience who share similar struggles. Additionally, having students and early faculty share their journey with mental health will provide audience members with another perspective on engineering culture from those who do not always have a lot of power in the university.

Based on our conceptual framework we plan to start discussions based on the dimensions of: “An engineering way of doing”, “being an engineer”, and “relationships”. Audience members will leave this panel with more insight into how we can change engineering culture for the better.

II. BACKGROUND

Studies show over 60% of college students in the United States struggle with at least one mental health problem [1]. A variety of factors can trigger mental health issues, including but not limited to cultural norms, finances, climate, and sociopolitical issues [2]. Engineering students operate within many distinct cultures including an “engineering culture”. researchers have described how this culture can be exclusive, competitive, and very male-dominated [3], [4], making it toxic

for many students. Engineering's toxic culture can cause depression, anxiety, and a lack of belonging in students [5].

In this work, we lean on three dimensions of Godfrey and Parker's 2010 framework [6] describing engineering norms and culture: “An engineering way of doing”, “being an engineer”, and “relationships”. “An engineering way of doing” has to do with shared beliefs about how teaching and learning are accomplished in engineering [6]. At many universities, this includes the myths that heavy workloads are a critical part of earning a worthwhile degree or that hardship and learning are synonymous with each other. Understanding how people in an engineering college conceptualize this aspect of culture can help us understand the best way to enact change to make the degree process less purposefully painful for students. The dimension of “being an engineer” includes common attributes and attitudes that are associated with being an engineer [6], including being tough and self-reliant, conservative, high achieving academically, and unemotional [7], [8], [9]. This definition of an “engineer” may make those who do not have (or value) these traits feel like they do not belong in engineering, even if they are interested in and capable of being an engineer. Finally, the last dimension that we utilize in this work is that of “relationships”. Godfrey and Parker [6] outline this dimension as the established norms and beliefs about how people should relate to one another.

Gaining further insight into these three dimensions at a given university can help researchers further understand the environment in which students operate and how it can affect their mental health.

III. PANEL DESCRIPTION AND AGENDA

A. Introductions and Context (20 minutes)

This panel will start with a short mindfulness and breathing exercise (~ 5 minutes) to help attendees take some space for themselves in the conference. Introductions from our panelists will follow (~5 minutes). One of our panelists will then give a brief presentation on the background of engineering culture and mental health and some context as to why we are putting on this panel (~ 10 minutes).

B. Panelist Discussion (35 minutes)

We will then transition to having our panelists address the questions about their experiences (~ 35 minutes total). A moderator will ask panelists questions, starting with describing experiences they've had with mental health and wellness issues in their engineering education. Panelists will then discuss the relation of their mental health experiences with engineering culture and the problematic aspects of the culture. Panelists will then transition into discussing ways students can help pioneer change in engineering culture and help support others who are struggling with their mental health. Finally, we will wrap up the panelist discussion on what they would like to see faculty and administration at universities do in order to change engineering culture to one that prioritizes mental health and well-being.

C. Group Discussions (25 minutes)

To wrap up the session we will have breakout tables/groups where smaller groups of the audience will discuss some of the questions we have prepared, shown below (~15 minutes). Panelists will join groups to join in the table discussions. We will wrap up the whole session with a quick report-out of what people have discussed in their smaller groups (~ 10 minutes).

- 1) What are your experiences with engineering culture and its effect on your mental health and well-being?
- 2) What are some resources at your institution that you have found useful in supporting your engineering education?
- 3) What barriers do you think we face in trying to change engineering culture to one that promotes well-being?
 - a) What are some initial steps that you feel you can take at your institution to help change engineering culture?

IV. EXPECTED OUTCOMES

Attendees will leave this panel session having more insight into student experiences and perceptions of engineering with regard to their mental health. Attendees will also leave with a better understanding of the framework as a tool for thinking about mental health and engineering culture. They will consider how they conceptualize, experience, and contribute to engineering culture.

Faculty will leave with some ideas on how to help students they see struggling and to help them create a better environment for those in engineering around them. Students will leave knowing that they are not alone in their mental health struggles and have ideas of resources they can reach out to for themselves. This panel will aid in opening the dialogue around mental health and wellness in engineering and hopefully help reduce the stigma that still exists around the topic. Additionally, we will highlight ways for students to help their peers and create a culture amongst their peer groups that puts wellness at the forefront.

V. PANEL PARTICIPANTS

A. Moderator:

Dr. Nichole Ramirez is an assistant professor at the Department of Engineering Education and Leadership at UTEP. She has worked on research projects exploring mental health and help-seeking attitudes within engineering culture. She is a strong advocate of student mental health and is involved in the National Alliance of Mental Illness. Her research expertise makes her a great leader in facilitating deep discussion on the topic.

B. Participants:

Sowmya Panuganti is a graduate student at Purdue University in Engineering Education. She has been deeply interested in engineering culture and has had personal experiences with this culture affecting her well-being. She plans on pursuing her dissertation research in this area.

Isil Anakok is a graduate student at Virginia Tech in Engineering Education. She is interested in sense of belonging and empathy in engineering education. She will provide her perspective on engineering culture and her experience with it as an international student.

Sri Yash Tadimalla is a graduate student at University of North Carolina Charlotte. His research focuses on how identity impacts how people perceive and interact with technologies. Over the past three years he has led mental health advocacy efforts as a meditation teacher. He is also a mental health policy advocate at institutional, regional and global levels.

Dr. Rachel Figard is an Assistant Professor at the University of Georgia in the Engineering Education Transformations Institute (EETI) and the Department of Environmental, Civil, Agricultural, and Mechanical Engineering (ECAM). Her primary areas of research include disabled student experiences, design justice, the impact of institutional policy and practice on student experience, and accessible user experience design. She will provide her perspective on engineering culture with regards to disabled student experiences. She is also a new professor and can bridge the divide between faculty and student experiences.

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REFERENCES

- [1] M. E. Flannery, "The Mental Health Crisis on College Campuses | NEA." Accessed: Apr. 13, 2024. [Online]. Available: <https://www.nea.org/nea-today/all-news-articles/mental-health-crisis-college-campuses>
- [2] E. Riachi, J. Holma, and A. Laitila, "Psychotherapists' views on triggering factors for psychological disorders," *Discov. Psychol.*, vol. 2, no. 1, p. 44, Dec. 2022, doi: 10.1007/s44202-022-00058-y.
- [3] J. Cromley, J. F. Mirabelli, and K. Jensen, "Board 409: The Stressors for Doctoral Students Questionnaire: Year

- 2 of an RFE Project on Understanding Graduate Engineering Student Well-Being and Retention,” presented at the 2023 ASEE Annual Conference & Exposition, Jun. 2023. Accessed: Aug. 31, 2023. [Online]. Available: <https://peer.asee.org/board-409-the-stressors-for-doctoral-students-questionnaire-year-2-of-an-rfe-project-on-understanding-graduate-engineering-student-well-being-and-retention>
- [4] K. Jensen, “The Time is Now to Build a Culture of Wellness in Engineering,” vol. 2, no. 2, pp. 42–45, Jun. 2021, doi: 10.21061/see.67.
 - [5] K. J. Jensen and K. J. Cross, “Engineering stress culture: Relationships among mental health, engineering identity, and sense of inclusion,” *J. Eng. Educ.*, vol. 110, no. 2, pp. 371–392, Apr. 2021, doi: 10.1002/jee.20391.
 - [6] E. Godfrey and L. Parker, “Mapping the Cultural Landscape in Engineering Education,” *J. Eng. Educ.*, vol. 99, no. 1, pp. 5–22, Jan. 2010, doi: 10.1002/j.2168-9830.2010.tb01038.x.
 - [7] E. A. Cech, “Engineering ableism: The exclusion and devaluation of engineering students and professionals with physical disabilities and chronic and mental illness,” *J. Eng. Educ.*, vol. 112, no. 2, pp. 462–487, Apr. 2023, doi: 10.1002/jee.20522.
 - [8] D. Riley, *Engineering and social justice*. Cham, Switzerland: Springer, 2008.
 - [9] R. Stevens, D. Amos, A. Jocuns, and L. Garrison, “Engineering As Lifestyle And A Meritocracy Of Difficulty: Two Pervasive Beliefs Among Engineering Students And Their Possible Effects,” presented at the 2007 Annual Conference & Exposition, Jun. 2007, p. 12.618.1-12.618.17. Accessed: Jul. 31, 2023. [Online]. Available: <https://peer.asee.org/engineering-as-lifestyle-and-a-meritocracy-of-difficulty-two-pervasive-beliefs-among-engineering-students-and-their-possible-effects>